

REMARKS/ARGUMENTS

Claim 7 has been canceled. Claims 1-6 and 10-24 are active in the case.

Reconsideration is respectfully requested.

The present invention relates to copolymers of ethylenically unsaturated acid-group-containing monomers and a hydrophobic monomer component for the prevention of the deposition of inorganic and organic deposits.

Claim Amendments

Claim 1 has been amended by limiting reactant (a) to a monoethylenically unsaturated, acid-group-containing monomer selected from the group consisting of monocarboxylic acids, dicarboxylic acids and sulfonic acids, and reactant (b) to at least a copolymerizable hydrophobic monocyclic terpene hydrocarbon. The proportion of component (b) in the copolymer is within the range of 0.2 to < 20 wt %.

Claims 13 and 17 have been amended so that they are consistent with the language of Claim 1. None of the amendments are believed to have introduced new matter into the case. Entry of the amendments into the record is respectfully requested.

Claim Rejection

Claims 1-7, 10, 13-15 and 17-21 stand rejected based on 35 USC 103(a) as obvious over Fujikake et al, U. S. Patent 6,084,032 in view of Werres et al, U. S. Patent 5,656,177. This ground of rejection is respectfully traversed.

The Fujikake et al patent, in fact, discloses a polymer composition based on a cross-linked polymer that is prepared by the reaction of an  $\alpha,\beta$ -unsaturated carboxylic acid and a cross-linking agent which is defined as a compound that has at least two ethylenically unsaturated groups. The polymeric material is combined with at least one of

polyvinylpyrrolidone and polyethylene oxide. The crosslinker includes compounds such as the acrylate esters having two or more acryloyl moieties prepared from such polyols as ethylene glycol, propylene glycol and polyethylene glycol (col 2, lines 5-22). Applicants emphasize that the cross-linking which occurs in the polymer formation reaction is based on the presence of at least two reactive, ethylenically unsaturated groups of the crosslinker. In the cross-linking reaction, a branching point is generated provided that both of the at least two reactive, ethylenically unsaturated groups react in a radical polymerization reaction, thereby leading to a cross-linked polymer network.

The present invention stands in stark contrast to the disclosure of Fujikake et al, because the invention requires the reaction of a monoethylenically unsaturated, acid-group-containing monomer selected from the group consisting of monocarboxylic acids, dicarboxylic acids and sulfonic acids with at least a copolymerizable hydrophobic monocyclic terpene hydrocarbon. In fact, the monocyclic terpene hydrocarbon reactant of the present claims is not a cross-linker, whereas, as noted above, Fujikake et al requires a cross-linker as a reactant. With regard to hydrophobic monocyclic terpene hydrocarbons such as limonene or dipentene, applicants point out that the double bond of the cyclohexene component of the compounds does not enter in to radical polymerization reactions. Rather, the ring unsaturation simply reacts with the exocyclic double bond present in these molecules. Accordingly, the stated compounds do not have at least two radically polymerizable ethylenically unsaturated groups as required by Fujikake et al, which means that the radical polymerization of limonene does not yield cross-linked products. Applicants submit that the enclosed Sharma et al publication (2004) supports applicants position in that the reference, on the last of the document, the polymer chain propagation reaction of the reaction of styrene with limonene occurs by the linear radical reaction of the vinyl group of styrene with the vinyl moiety of the propylene group of limonene thereby producing a

polymer backbone of methylene groups. FT-IR and NMR spectra are consistent with the propagation reaction which is presented in the publication. Accordingly, hydrophobic monocyclic terpene hydrocarbons such as limonene or dipentene are not suitable as cross-linkers, and thus one of skill in the art would not have replaced any of the cross-linkers disclosed in Fujikake et al. Thus, the present invention as claimed is quite distinct from Fujikake et al.

The Werres et al '177 patent is virtually identical in its disclosure to previously applied and discussed Werres et al WO/15296. The reference only discloses oil-in-water emulsions for the prevention of slime formation and inhibition of microbes in water carrying systems. The emulsions are formulated of the likes of saturated or unsaturated isomeric hydrocarbons, saturated or unsaturated fatty alcohols or fatty acids, esters of saturated or unsaturated fatty acids with polyalcohols, an acyclic, monocyclic or bicyclic terpene, or the like. Not only does the reference not describe an emulsion of a polymer material from the monomers described in the present claims, it does not describe a polymer prepared by radical polymerization. The patent only describes a physical mixture of single non-polymeric molecules, e.g., terpene hydrocarbons or unsaturated fatty acids, in an aqueous medium. Moreover, many of the molecules types that are disclosed can not be radically polymerized, and in the case of the terpenes described, the reference does not disclose whether the terpenes contain olefinic double bonds. Accordingly, the Werres et al patent does not improve upon the deficiencies of Fujikake et al. Withdrawal of the rejection is respectfully requested.

Claims 11, 12, 16 and 22-24 stand rejected based on 35 USC 103(a) as obvious over Fujikake et al, U. S. Patent 6,084,032 in view of Werres et al, U. S. Patent 5,656,177 further in view of Behr et al, U. S. Patent 5,756,624. This ground of rejection is respectfully traversed.

As previously has been stated, the Behr et al patent discloses the use of a polymer based on a terpene monomer as a textile sizing agent. However, while the patent discloses a copolymer that is formed by copolymerizing a terpene compound with an unsaturated mono- or dicarboxylic acid and a vinyl-type comonomer, the scope of terpene compounds disclosed by the patent is not limited to the monocyclic terpene of the present claims. In fact, as is clear from the discussion above, the scope of the invention is substantially more narrowly claimed. Moreover, its disclosure is such that it fails to overcome the deficiencies of the Fujikake et al and Werres et al references relative to the invention as claimed in view of the substantial differences of the subject matter of these two references as discussed above from the subject matter of the present claims as discussed above. Withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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